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# Acute Care Surgery Models: What The Evidence Tells Us

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The **Effective Practice & Organisation of Care (EPOC) Group** is Cochrane's health services & policy group.

EPOC promotes reviews of effectiveness of interventions addressing the organisation & delivery of health services, financing, regulatory interventions, and provider behaviour change strategies.

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**Winnipeg Regional  
Health Authority**

**Office régional de la  
santé de Winnipeg**

**Outcomes of Consolidating Non-Elective Surgery:  
The “Surgical Hospitalist/Acute-Care Surgery” Model  
a systematic review**

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# Criteria for Selecting Studies

## Patients

- All patients of all ages requiring non-elective surgery in developed countries

## Intervention

- All models in which all emergency or non-elective surgery (i.e. not only trauma surgery) was assigned to designated surgeon(s) or location(s).

## Comparator

- Any comparator

# Primary Outcome Measures

## Access to non-elective surgery

- Wait time to non-elective surgery (i.e., time from when patients present to when they receive surgery)
- Measures of particular segments of the wait (e.g., length of stay in the Emergency Department)
- Proportion of patients seen or treated within benchmark time.

## Surgical Outcomes

- Mortality
- Complications
- Inpatient length of stay

# Secondary Outcome Measures

- Staff and patient satisfaction (measured by “pre” and “post” surveys),
- Educational opportunities for residents, and
- Any unintended impacts and harms.

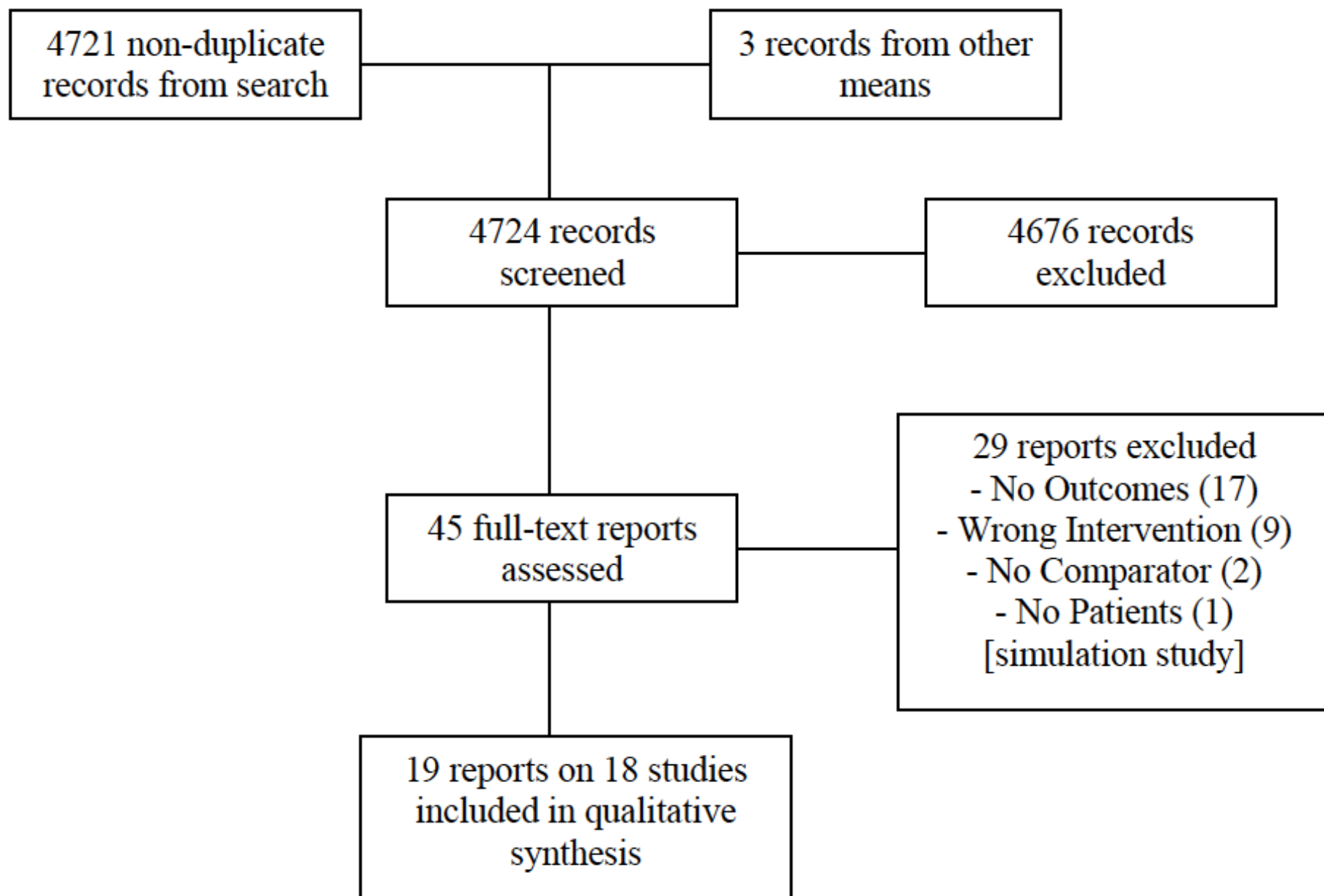
# Study Designs

- Interrupted Time Series
- Pre-post analyses
- Any other experimental or quasi-experimental design
  - RCT, CCT, Controlled Before & After
- Excluded simple post measures without comparison

# Search Methods

Specialist information librarian, double screening

- Search strategy using MeSH Headings & free text strings “acute care surgery” “surgical hospitalist” “emergency general surgery” and combinations of these words.
- PubMed, EMBASE, CINAHL, Scopus, Dissertation Abstracts, Web of Science up to August 12<sup>th</sup>, 2009
- CADTH Grey Matters
- Google Search
- Experts on the Advisory Panel
- Reference Lists of Included articles



# Results

18 studies

- USA (10), UK (4), Canada (3), Australia (1)

Outcomes

- Patient access (6)
- Surgical outcomes (9)
- Timing of surgery
- Workload

# Four basic categories of ACS models

1. Separating acute-care from elective surgery through a *new role*, sometimes called the surgical hospitalist. (6 studies)
2. *Expanding an existing trauma service* to include emergency general surgery. (8 studies, all USA)
3. Creating a *dedicated 24-hour emergency operating theatre*. (2 studies, both UK)
4. *Regionalization* of acute-care surgery to certain sites within a multi-hospital system. (2 studies, both Canadian)



# Quality

All had a high risk of bias:

- most were simple pre-post designs
- Many failed to control for changes in the patient population
- Most interventions included components other than surgical consolidation per se – eg addition or replacement of staff

Therefore the included studies were unable to provide conclusive evidence about the impacts of the Acute Care Surgery model, but they can provide suggestive evidence, while pointing the way to further research

## Access (6 studies)

- Implementing a surgical hospitalist role consistently improved efficiency and reduced emergency patients' wait for surgery
- With regionalization or combined trauma/emergency services, it enables increased volumes without increased waits.
- Reduced variance of wait time, suggesting that the intervention reduced the incidence of unusually long waits.
- It was unclear which part of the wait was most likely to change; depends on the intervention and the status quo it replaced.
- No studies assessed how a dedicated emergency theatre affects access, or how regionalization affects wait times at the pan-regional level.

# Surgical Outcomes (9 studies)

- Surgical hospitalist role may improve, and at least doesn't worsen, appendectomy outcomes (3 studies)
- Failure to control for case-mix or clinical practice a major flaw
- Unclear what effect expansion of trauma services has on care of trauma patients
- No good evidence about effects of dedicated emergency theatre or regionalisation on patient safety.

# Timing of Surgery

- Surgical hospitalist role consistently associated with reduced out-of-hours operating, but only in hospitals with a 24-hour dedicated emergency theatre (3 studies). In one study, a surgical hospitalist with no 24-hour theatre access led to increased out-of-hours operating.
- Designated emergency theatre alone reduced night-time operating in 2 studies.
- 2 studies of regionalisation didn't address timing of surgery, but one noted increased out-of-hours admissions when hospital became a referral centre

# Workload

- The outcome most frequently studied
- Affected by nearly all the interventions that reshaped roles
- Trauma surgeons' workload increased when took on responsibility for emergency general surgery
- Regionalisation led to pressures to reduce elective and low-acuity patients
- Surgical hospitalist role appeared to be a facilitator for increased volumes, but any direct impact was unclear
- Studies of dedicated emergency theatre did not address workload.
- Increased workload obviously can be seen as good or evil.

# Big Question is what is the net effect

How the balance plays out between:

- Pros:
  - More timely surgery
  - Surgeon who more frequently performs the procedure
- Cons
  - Heavy increases in workload
  - Longer waits for certain patients

This will depend on local circumstances and the exact model being employed

# Key messages from this review

Promising indications that the surgical hospitalist/acute care surgery model may improve access to non-elective surgery

Available studies have too high risk of bias to permit firm conclusions

Little is known about impacts of consolidation at the regional as opposed to the hospital level



# Future implementation studies should

Use superior study designs;

Assess and control for possible confounds, including changes in the patient population;

Investigate patient access

Use surgical-outcome measures that are sensitive

Monitor workload and its distribution across all areas;

Incorporate perspectives of physicians and non-physician staff.

Focus particularly on the regionalization of acute care surgery, - the results of hospital-level studies cannot be generalised

